Spellman’s XRF Series allow for a wide range of input voltages and supply either 80W, 320W or 640W of output power at up to 160kVdc. These lightweight rack-mountable X-ray generators house a miniaturized high voltage system in a solid encapsulated, oil-free design. The XRF Series is designed with a power factor corrected input circuit which reduces harmonic emissions and noise normally associated with other high frequency switching power supplies. The XRF Series incorporates an internal floating filament and a closed-loop emission control circuit for precise regulation of emission current. Remote monitoring and control of voltage, current and filament current is also provided.

**TYPICAL APPLICATIONS**
- X-ray Inspection
- Non-Destructive Testing

**OPTIONS**
- **AOL** Adjustable Overload
- **GS** Grid Supply
- **PC** Power Control
- **AT** Arc Trip
- **SS(X)** Non Standard Slow Start

**SPECIFICATIONS**

**Input Voltage:**
- 80W: 90-125 and 180-264Vac at 48-62Hz.
- 320W: 180-264Vac at 48-62Hz.
- 640W: 180-264Vac at 48-62Hz.

**Power Factor:**
0.9 or better.

**High Voltage Supply:**

- **Output Voltage:**
  - 0-160kV, negative polarity.

- **Output Current:**
  - 80W: 0.5mA max.
  - 320W: 2.0mA at 160kV; 3.0mA at 100kV.
  - 640W: 4.0mA.

- **Output Voltage Stability:**
  Within 0.1% of set value after warm-up period at full load.

- **Output Voltage Ripple:**
  - 80W & 320W: <0.1%, or 160V p-p for high freq., and line freq. at full load.
  - 640W: 0.03% rms <1kHz, 0.75% rms above 1kHz.

- **Beam Current Stability:**
  - 80W: Within 0.1% of set value after 1/2 hour warm-up at constant output setting of 30-160kV and line voltage of 90-125 & 180-264Vac.
  - 320W & 640W: Same as 80W except line voltage of 180-264Vac.

**Filament Supply:**
- Constant current DC filament supply with closed-loop current feedback.

**Filament Voltage:**
- 7V rms (high frequency) max.

**Filament Current:**
- 5A max., adjustable 0-5.0A by external Filament Limit Programming input.

**Floating Grid Power Supply (80W Unit Only):**
- **Grid Supply:** The grid supply controls tube beam current in a closed-loop regulation design.

- **Grid Voltage:**
  - 0 to 1200Vdc.

- **Grid Voltage Ripple:**
  - Less than 1.0V rms at any frequency.

- **Grid Supply Response:**
  - Less than 0.5mA in less than 10ms.

**Control and Monitoring:**
- **Analog Control Inputs:**
  - Three inputs have internal load resistance greater than 330kohms.

- **Voltage Programming:**
  - 80W & 640W: 0 to +10Vdc, where 10.0Vdc = 160kV output.
  - 320W: 0 to +10Vdc, where 8.0Vdc = 160kV output.

- **Beam Tube Current Control:**
  - 80W: 0 to +10Vdc, where 10.0Vdc = 0.5mA tube current.
  - 320W & 640W: 0 to +6Vdc, where 6.0Vdc = 3.0mA tube current.
  - 640W: 0 to +10Vdc, where 10.0Vdc = 4.0mA tube current.

- **Filament Current Control:**
  - 80W & 640W: 0 to +10Vdc, where 5.0Vdc = 5.0A filament current.

**Control and Monitor Outputs:**
- (See Tables For Details)
- **Digital Control Inputs:**
  - 80W: Grid Inhibit.
  - 640W: Filament Select.

**Connections:**
- **Output Connector:**
  - 160kV European Conical connector with 2-ring and center pin end.

- **Input Power Connector:** 5-pin male MS-type, Amphenol P/N 97-3102A-18-20P

- **Control Connections:** 25-pin “D” connector, male, chassis-mounted.
Environmental:
0 to +50°C at 10-95% RH, non-condensing.
Forced convection cooling.

Dimensions:
7”H x 19”W x 22”D. (17.8cm x 48.3cm x 55.9cm).

Regulatory Approvals:
Compliant to 2004/108/EC, the EMC Directive and 2006/95/EC, the Low Voltage Directive.

160kV XRF SELECTION TABLE

<table>
<thead>
<tr>
<th>OUTPUT VOLTAGE (kV)</th>
<th>OUTPUT CURRENT (mA)</th>
<th>OUTPUT POWER (W)</th>
<th>MODEL NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>160</td>
<td>0.5</td>
<td>80</td>
<td>XRF160N80</td>
</tr>
<tr>
<td>160</td>
<td>2.0</td>
<td>320</td>
<td>XRF160N320</td>
</tr>
<tr>
<td>160</td>
<td>4.0</td>
<td>640</td>
<td>XRF160N640</td>
</tr>
</tbody>
</table>

160kV XRF 80W, 320W, 640W, 25 PIN

J2—AC INPUT CONNECTOR WIRING

<table>
<thead>
<tr>
<th>5 Pin MS Type</th>
<th>7 Pin UTG Type</th>
<th>CONNECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1</td>
<td>Auxiliary (Logic) Line</td>
</tr>
<tr>
<td>B</td>
<td>2</td>
<td>Auxiliary (Logic) Neutral</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>Ground</td>
</tr>
<tr>
<td>D</td>
<td>4</td>
<td>Main (Inverter) Line</td>
</tr>
<tr>
<td>E</td>
<td>5</td>
<td>Main (Inverter) Neutral</td>
</tr>
</tbody>
</table>

160kV XRF 80W, 320W, 640W TERMINAL BLOCK 10 PIN

TB1 SIGNAL PARAMETERS

<table>
<thead>
<tr>
<th>SIGNAL</th>
<th>parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Interlock</td>
</tr>
<tr>
<td>2</td>
<td>Interlock Return</td>
</tr>
<tr>
<td>3</td>
<td>KV Monitor</td>
</tr>
<tr>
<td>4</td>
<td>mA Monitor</td>
</tr>
<tr>
<td>5</td>
<td>Filament Monitor</td>
</tr>
<tr>
<td>6</td>
<td>Bias Monitor</td>
</tr>
<tr>
<td>7</td>
<td>HV ON Indicator</td>
</tr>
<tr>
<td>8</td>
<td>Voltage Mode Indicator</td>
</tr>
<tr>
<td>9</td>
<td>Current Mode Indicator</td>
</tr>
<tr>
<td>10</td>
<td>GND</td>
</tr>
</tbody>
</table>

160kV XRF 80W, 320W, 640W, 25 PIN

DIMENSIONS: in.[mm]

DIMENSIONS: in.[mm]

Environmental:
0 to +50°C at 10-95% RH, non-condensing.
Forced convection cooling.

Dimensions:
7”H x 19”W x 22”D. (17.8cm x 48.3cm x 55.9cm).

Regulatory Approvals:
Compliant to 2004/108/EC, the EMC Directive and 2006/95/EC, the Low Voltage Directive.

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<tr>
<td>160</td>
<td>2.0</td>
<td>320</td>
<td>XRF160N320</td>
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<td>160</td>
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<td>5</td>
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160kV XRF 80W, 320W, 640W, 25 PIN

DIMENSIONS: in.[mm]

DIMENSIONS: in.[mm]

Environmental:
0 to +50°C at 10-95% RH, non-condensing.
Forced convection cooling.

Dimensions:
7”H x 19”W x 22”D. (17.8cm x 48.3cm x 55.9cm).

Regulatory Approvals:
Compliant to 2004/108/EC, the EMC Directive and 2006/95/EC, the Low Voltage Directive.

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<td>160</td>
<td>2.0</td>
<td>320</td>
<td>XRF160N320</td>
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160kV XRF 80W, 320W, 640W, 25 PIN

DIMENSIONS: in.[mm]

DIMENSIONS: in.[mm]

Environmental:
0 to +50°C at 10-95% RH, non-condensing.
Forced convection cooling.

Dimensions:
7”H x 19”W x 22”D. (17.8cm x 48.3cm x 55.9cm).

Regulatory Approvals:
Compliant to 2004/108/EC, the EMC Directive and 2006/95/EC, the Low Voltage Directive.

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160kV XRF 80W, 320W, 640W, 25 PIN

DIMENSIONS: in.[mm]

DIMENSIONS: in.[mm]

Environmental:
0 to +50°C at 10-95% RH, non-condensing.
Forced convection cooling.

Dimensions:
7”H x 19”W x 22”D. (17.8cm x 48.3cm x 55.9cm).

Regulatory Approvals:
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160kV XRF 80W, 320W, 640W, 25 PIN

DIMENSIONS: in.[mm]

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Dimensions:
7”H x 19”W x 22”D. (17.8cm x 48.3cm x 55.9cm).

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